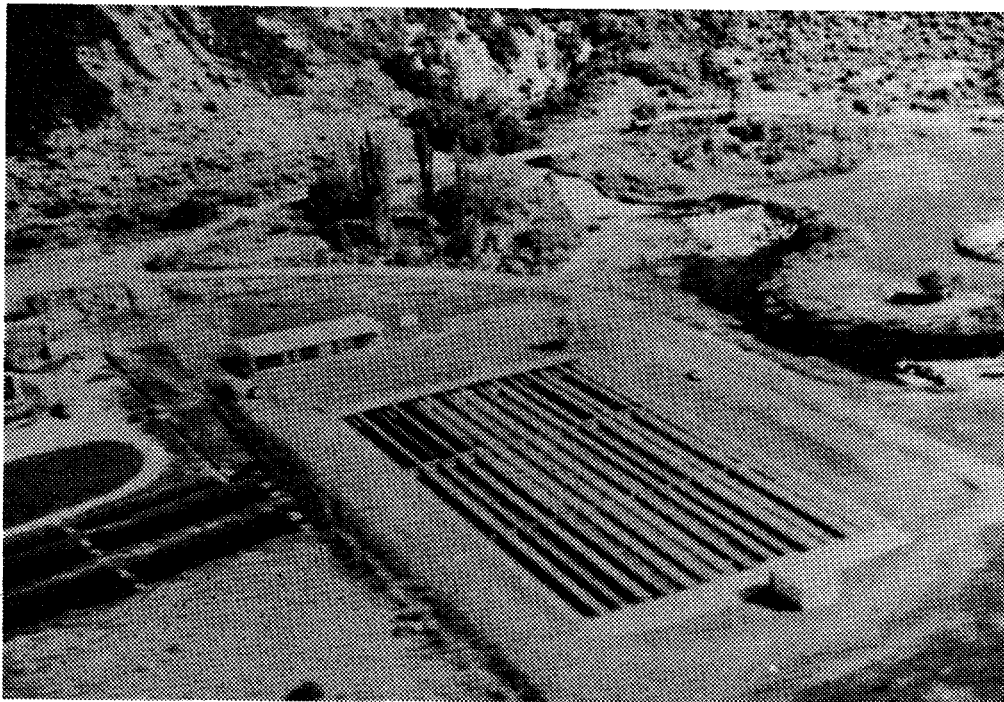




# Idaho Power

## NIAGARA SPRINGS STEELHEAD HATCHERY ANNUAL REPORT

Brood Year 1988



by

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## **ABSTRACT**

Niagara Springs Hatchery received 2,469,688 steelhead eggs from Pahsimeroi and Oxbow Hatcheries in April and May 1988. The hatchery received 210,644 fingerling steelhead from Hagerman National Hatchery in November 1988. These steelhead were from eggs taken at the Pahsimeroi Hatchery.

A feed conversion of 1.41 was achieved after feeding 574,770 pounds of feed to produce 406,700 pounds of fish. Fish feed cost was \$174,261.24 for the year, resulting in a cost of 42.8 cents per pound of fish produced.

A total of 1,666,200 steelhead, averaging 4.1 fish per pound, were planted for the 1988 brood year. Spring smolt releases included: 508,300 fish in the Pahsimeroi River, 206,700 in the Salmon River at Shoup Bridge, 208,500 at the mouth of the North Fork Salmon River, 735,500 smolts in the Snake River below Hells Canyon Dam, and a final plant of 7,200 fish at the mouth of Hammer Creek.

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## INTRODUCTION

Niagara Springs Steelhead Hatchery is located 10 miles south of Wendell, Idaho in the Snake River Canyon. The hatchery is owned and financed by Idaho Power Company and is one of the largest privately owned steelhead hatcheries in the country. The hatchery is part of Idaho Power's multimillion dollar fish conservation program which is required under the terms of their Federal Energy Regulatory Commission license for the operation of the Hells Canyon hydroelectric complex. The purpose of the hatchery is to relocate a portion of the Snake River run of steelhead trout into the Salmon River and also to preserve and enhance the steelhead run in the Snake River below Hells Canyon Dam. The Idaho Department of Fish and Game staffs and operates this facility.

This hatchery's water supply is by gravity flow from Niagara Springs and maintains a constant, year-round temperature of 58°F. Twenty upwelling incubators are used for hatching of eyed eggs. Rearing units include 20 six-foot circular vats and fourteen 300-foot raceways which are capable of using 130 cubic feet per second of water. Seven of these 300-foot raceways accommodate fourteen 20-foot nursery raceways. Spring water is also used for domestic purposes and for the irrigation of ten acres of lawn.

The hatchery consists of a 30 x 90 foot building that encloses an office, two incubator rooms, a storage room, a small shop, a garage and public restrooms. The hatchery has a small storage building for storing pumps and other equipment. A 20-ton water chiller located at the south end of the raceways cools spring water for fish transportation. Three woodframe houses and one mobile home provide housing for the four permanent employees.

## OBJECTIVES

The purpose of Niagara Springs Hatchery is to preserve a run of steelhead Oncorhynchus mykiss in the Snake River below Hells Canyon Dam and to relocate a portion of that run to the Salmon River drainage.

The fish culture objectives of Niagara Springs Hatchery are:

1. To rear 200,000 pounds of steelhead smolts for release in the Salmon River drainage.
2. To rear 200,000 pounds of steelhead smolts for release in the Snake River below Hells Canyon Dam.

## EGG AND FINGERLING SHIPMENTS

Pahsimeroi Hatchery shipped 1,256,289 eyed steelhead eggs to Niagara Springs Hatchery beginning April 11 and ending May 6, 1988. A total of 1,213,399

eyed eggs were received from Oxbow Hatchery between April 25 and May 11, 1988. In addition, 210,644 fingerlings were received from Hagerman National Hatchery on November 10, 1988. These fish were Pahsimeroi stock, shipped to Hagerman as eyed eggs via Sawtooth Hatchery. The total number of eggs and fingerlings received for the year was 2,680,332.

The first eggs began hatching on April 12 and the last hatched on May 18, 1988. Fry were started on soft moist feed when 50% of the fish had reached swim-up stage or 3,600 fish per pound. They were fed ad-lib until a strong feeding response occurred and then switched to the hatchery constant method.

## **FISH HEALTH**

On May 10, 1988, all outside raceways were disinfected with a 12.5% chlorine solution to prevent disease contamination and algal growth. All eggs received were disinfected with a 1:100 solution of iodine for ten minutes before being placed into the incubators.

Mortalities in the nursery remained within normally expected levels (0.1 to 0.3% per day) in 1988, with the exception of one incident. A disease episode caused the mortality of 351,399 sac-fry (Oxbow stock) between May 13 and May 19. Three vats, all from the same egg take, were involved. Mortality was high (1.9% per day) in the eggs and continued to rise as they hatched. Daily mortality reached 20,000 per vat by May 16th. On May 19th, only 2,000 fry remained in the three vats combined. The remaining fish were destroyed. All mortality was limed and buried, and the vats were disinfected. Infectious hematopoietic necrosis (IHN) was confirmed by the Eagle Fish Health Laboratory.

Hatchery staff cooperated in a study by J. Scott Foott of the Eagle Fish Health Lab. This study was designed to test the use of prophylactic treatments on fry in reducing early rearing mortalities and to aid in the development of an immune response to myxobacteria. Two vats of Pahsimeroi stock (243,303 fish) were given a 30-minute bath treatment with 1 ppm of 10% Nifurpirinol on May 23, 1988 and moved to Raceway #5. Daily mortalities of the test group and a control group (Raceway #6) were compared for 90 days.

The treated fry were experiencing relatively high mortalities from undetermined causes (0.8%/day) prior to treatment. Mortality dropped from 0.8% to 0.06% per day after nifurpirinol treatment and remained below 0.06% throughout the study period (Figure 1). The control group experienced episodes of high mortalities (0.59% to 0.7% per day) during the study period. IHN was later isolated from the control group. The treated fish were also observed to retain dorsal fin integrity longer than the control group. These results are encouraging, but due to the detection of IHN in the control group, a valid comparison of the two groups cannot be assumed. Nifurpirinol is not an approved foodfish drug due to possible carcinogenic properties, therefore further testing of this drug is not planned.

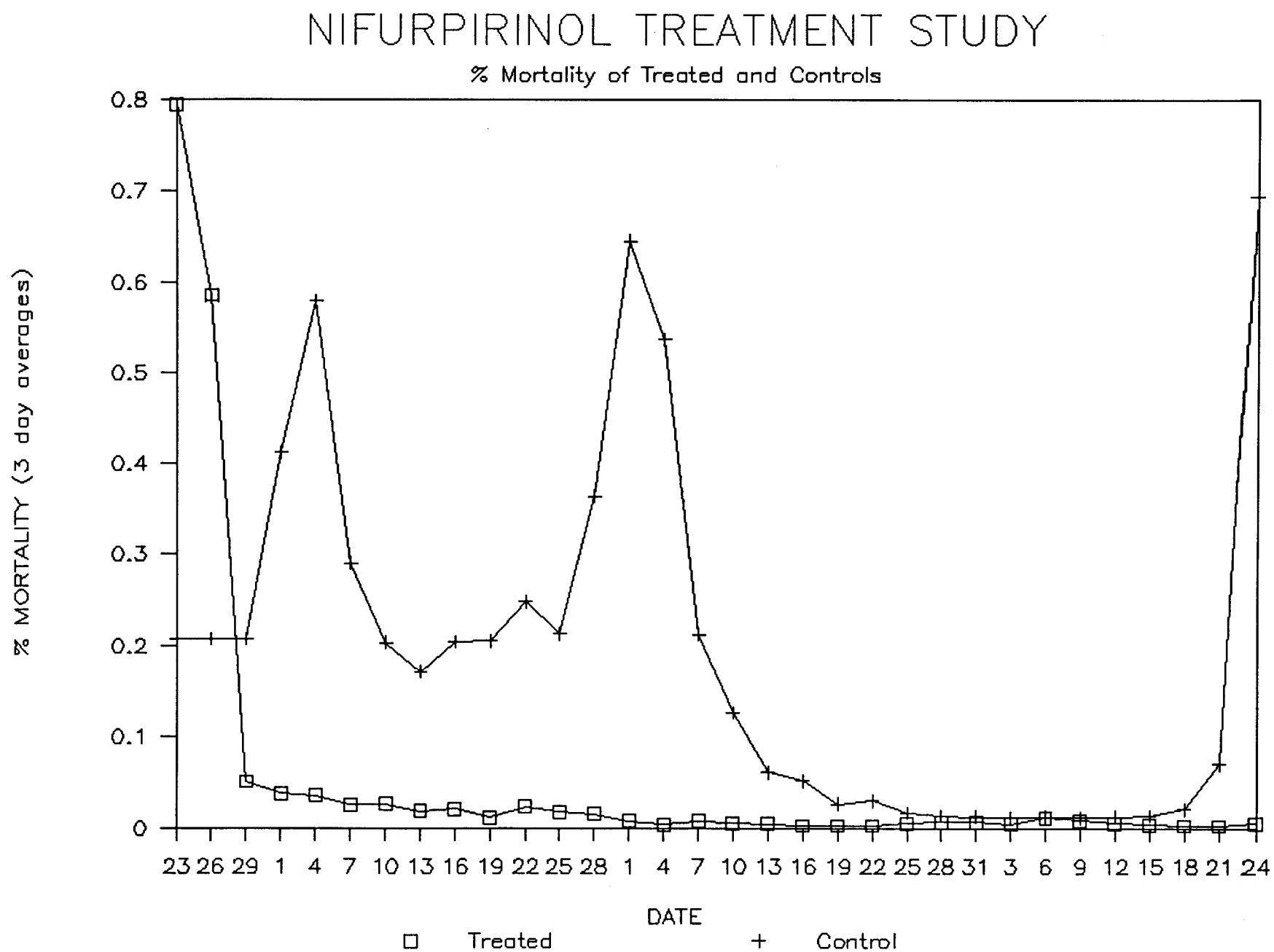


Figure 1. Mortality graph of nifurpirinol treatment study at Niagara Springs Hatchery.

On July 13 what appeared to be gram + cocci were detected in gram-stained kidney prints of fish in Raceway #9. The Eagle Fish Health Lab confirmed this but observed no growth of bacteria on agar plates. All viral assays were negative. Three prophylactic treatments of benzalkonium chloride (B.C.) at 2.0 ppm were administered to these fish on alternating days from July 13 through July 17. The pathologist recommended feeding tetracycline-treated feed for 14 days. The feed used was pre-mixed at 2 grams active drug per 100 lbs, and was fed at 1.9% of body weight. The fish did not respond to this treatment and mortalities remained constant.

In August, IHN was isolated from moribund fish in Raceway #9. Upon further review, the Gm+ cocci seen in kidney smears were found to be crystalline granules contaminating our gram stains and a very high number of melanin granules present in kidney tissues. The outbreak subsided by the end of August, after 15,000 fish had been lost. The final disease outbreak of the brood year was a mild episode of IHN in Raceway #10 during October. Mortalities from this episode were minimal (2,500).

One fish loss was experienced during smolt hauling on April 14, 1989. The freon cooling system developed a leak inside the chiller tank, contaminating the water in one tanker. The problem was not discovered until fish were loaded into the truck. The fish began to dart erratically about the tank after 1,800 pounds had been loaded. They died within five minutes. Hatchery personnel assumed that some type of poison had caused the kill, and did not unload the tanker until the specific cause had been determined. These fish were then taken to Fauna Industries of Hagerman, Idaho, for disposal.

Prophylactic treatments of B.C. were given to all raceways after adipose fin clipping (8/22 to 9/10, 1988) and coded wire tagging (1/29 to 2/5, 1989). Each raceway received three treatments of 2 ppm B.C. on alternating days after clipping.

#### **PRODUCTION AND FEEDING**

Niagara Springs Hatchery released 1,666,200 steelhead averaging 4.1 fish per pound and 8.6" long (total length). Production for the hatchery was 406,800 pounds during the 1988 brood year. The hatchery fed a total of 574,770 pounds of feed, for an overall conversion of 1.41 for the year. Average length increase per month was 0.705 inches. Monthly feed poundage, weight gain, and conversions are shown in Figure 2. Total feed cost was \$174,261.24, resulting in a cost of 42.8 cents per pound of fish produced. Feed sizes used are summarized in Table 1. Rangen and Silver Cup feeds were used this year. Steelhead were fed by hand in the outside raceways until they were large enough to take Number three feed. The Nielsen feeders on the bridge were then used until the fish were released.

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# WEIGHT GAIN, FEED USED, AND CONVERSION

Niagara Springs Hatchery, B.Y. 1988

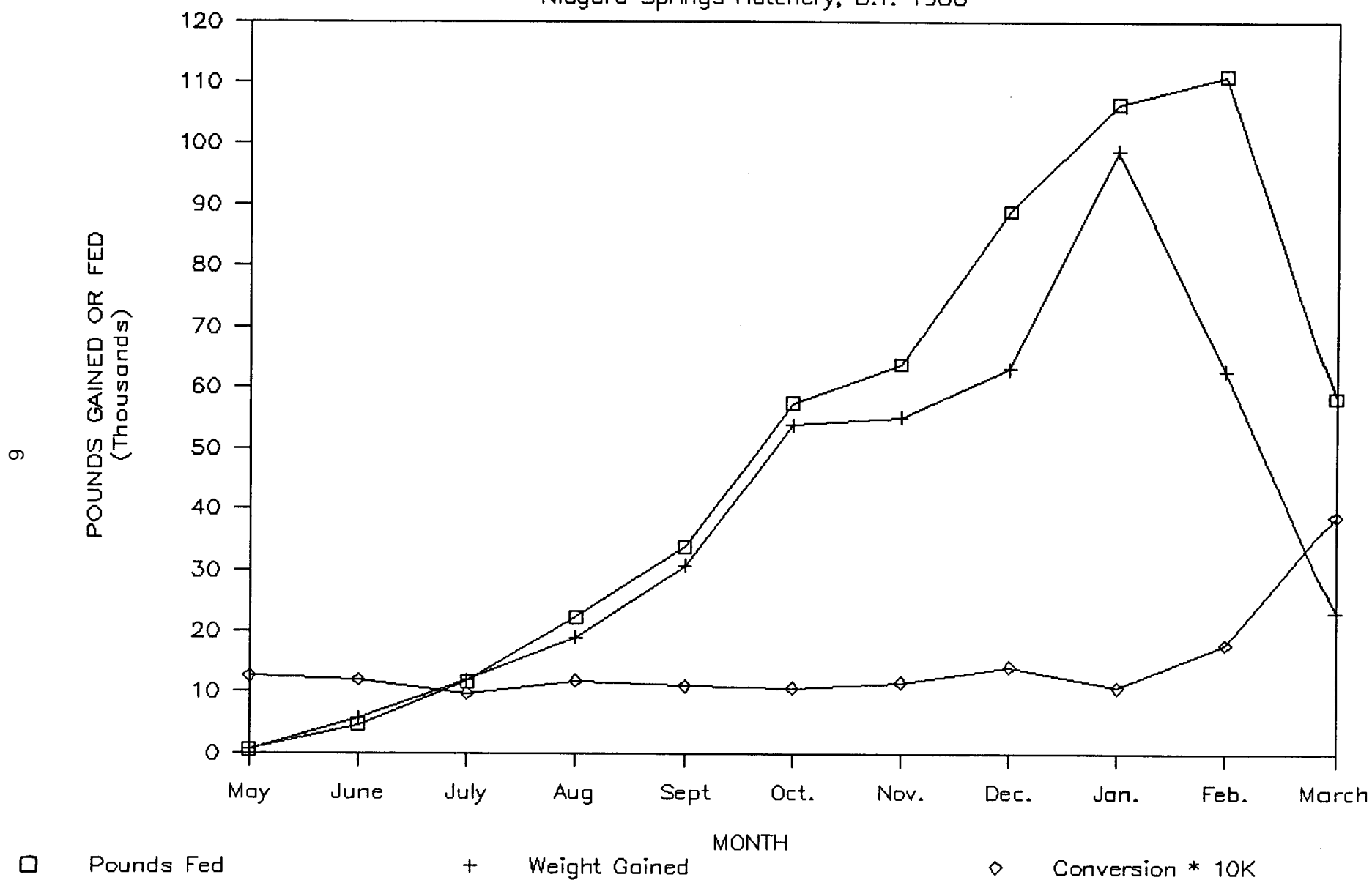


Figure 2. Monthly weight gain, feed used, and conversions for steelhead from Niagara Springs Hatchery.



## **FISH MARKING**

The adipose fin removal crew clipped all steelhead on the station between August 22 and September 6, 1988. A total of 1,585,398 fish were clipped. Initial clipping mortality was 2,753. Delayed mortality in the raceways was not monitored this year due to time constraints.

Coded wire tags were injected into 91,741 fish from January 23 to February 2, 1989. Two groups of Pahsimeroi fish were given coded wire tags. One group was released in the Salmon River at Shoup Bridge, while the other was released at the Pahsimeroi trap. All fish were given left ventral clips to identify them as tagged fish. The Shoup Bridge plant contained 44,130 fish and consisted of three tag codes. The Pahsimeroi group contained 47,250 fish from three tag codes. The number of fish from each tag code, release dates, and release sites are summarized in Table 2.

All freeze brands were replaced with PIT (Passive Induced Transmitter) tags this year. On March 30 and 31, 1989, PIT tags were placed in 2,802 steelhead. Six of these tagged fish died before release, leaving 2,796 PIT tags which were released in Hell's Canyon on April 25, 1989.

## **FISH RELEASES**

Smolts were released from April 7 through April 30, 1989. Pahsimeroi smolts were planted below the trap at Pahsimeroi Hatchery from April 7 through April 13, while Hells Canyon smolts were released at the boat ramp below Hells Canyon Dam from April 20 through April 28. Two outplants were made in the spring of 1989. Both outplants were in the mainstem Salmon River. The first was made at the boat ramp near the mouth of the North Fork Salmon River from April 13 to April 16. The second was at Shoup Bridge above the town of Salmon, Idaho, between April 17 and 22. The few smolts remaining at the hatchery were hauled to the mouth of Hammer Creek below Riggins, Idaho, with a load from Magic Valley Hatchery on April 29. Pounds and numbers of smolts released at each site are summarized in Table 3.

## **HATCHERY IMPROVEMENTS**

Private contractors built a new viewpoint overlooking Niagara Springs and faced the concrete diversion at the Rimview gates with lava rock so that it appears more natural. The Idaho Power Company shop crew built a 2-foot tall retaining wall around the headrace gate to contain water leakage and overhauled the two feed bin motors and conveyor system. An Idaho Power Company electrician rewired the automatic fry feeders and installed a new time clock. The station's John Deer lawn tractor was replaced with a new, updated model in June. All of the planks on the bridge, and many of the damboards, were replaced, and new screen frames and fry screens were constructed.

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Table 1. Feed size, quantities used, and cost of feed at Niagara Springs Hatchery for brood year 1988-89.

Feed size	Pounds	Cost/lb.	Cost + tax
Starter, Soft Moist	300	\$0.642	\$202.23
1/32, Soft Moist	1,050	\$0.581	\$640.55
#1 Dry	1,700	\$0.335	\$597.98
#2 Dry	4,750	\$0.335	\$1,670.81
#3 Dry	11,350	\$0.335	\$3,992.36
#4 Dry	23,260	\$0.282	\$6,504.52
3/32 Pellet	144,470	\$0.297	\$44,980.01
1/8 Pellet	289,290	\$0.285	\$86,718.24
5/32 Pellet	77,230	\$0.263	\$21,343.48
Special and Medicated Feeds			
#3 TM50	700	\$0.435	\$319.73
#4 3X vit.	5,000	\$0.317	\$1,664.24
3/32 3X vit.	15,670	\$0.432	\$5,627.10
Totals	574,770		\$174,261.24

Table 2. Release sites, release dates, and tag codes for coded wire Tagged fish from Niagara Springs Hatchery, brood year 188-89.

Release site	Release dates	Tag codes	No. released
Pahsimeroi River at trap	April 9 to	104150	14,464
	April 10, 1989	104151	13,333
		104152	13,107
		104153	5,393
Salmon River at Shoup Bridge	April 17 to	104147	13,399
	April 20, 1989	104148	13,899
		104149	15,945

Table 3. Plant sites, pounds, and numbers of smolts released from  
Niagara Springs Hatchery in April 1989.

Plant site	Plant dates	Pounds released	No. released
Pahsimeroi River	4/7 to 4/13	121,400	508,300
N. Fk. Salmon River	4/13 to 4/16	50,100	208,500
Salmon River at Shoup Br.	4/17 to 4/22	54,000	206,700
Snake River below			
Hells Canyon Dam	4/20 to 4/28	179,500	735,500
Salmon River at Hammer Cr.	4/29	1,800	7,200
Totals		406,800	1,666,200

## MISCELLANEOUS

The staff of permanent employees at the hatchery was: Jerry Mowery, Fish Hatchery Superintendent III; Arnie Miller, Fish Hatchery Superintendent I, who moved to Rapid River Hatchery and was replaced by Ralph Steiner; Bill Harryman, Fish Culturist; and Tim Wik, Fish Culturist, who moved to Clark Fork Hatchery and was replaced by Rick Westerhof. Temporary employees were: Paul Wert, Laborer; and Kent Green, Biological Aide.

The hatchery crew gave numerous slide shows and tours to school children, scouts, and other organizations. Hatchery personnel helped spawn fish at Rapid River and Henry's Lake hatcheries. They worked at check stations and performed some enforcement work during fishing and hunting seasons.

Jerry Mowery served on the department's Uniform Committee. Bill Harryman traveled to Pierre, South Dakota to trap spottail shiners and transport them back to Idaho waters. Rick Westerhof was chosen to lead a triploid fish management study group and gave a presentation about the project at the Idaho Chapter of AFS's annual conference in Boise, Idaho. In addition, all permanent employees attended In-Service Training School at Boise State University in May of 1988.

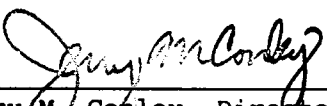
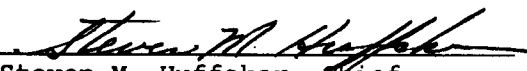
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